Amendments to the Specification:

*Please replace the **Brief description of the drawings** on page 6 of the specification with the following amended **Brief description of the drawings:***

The invention will now be described with reference to the drawings in which:

Figure 1 is a simplified block diagram of a quantum well infrared photodetector according to the invention;

Figure [[1]] 2 is a graphical representation of a double-pass 45-degree incidence transmission spectra at room temperature and with polarized light;

Figure [[2]] 3 is a graphical representation of spectral response curves at 80 K and 3 V wherein the full widths at half maximum are 260, 390, and 500 cm^{-1} for 1E12, 1.5E12, and 2E12 cm^{-2} doping samples, respectively;

~~Figure 3 is~~ Figures 4a -4c illustrate a graphical representation of measured responsivity versus applied voltage under a CO2 laser (10.6 μm) illumination and at various temperatures for the 1.5E12 cm^{-2} doping sample; and,

Figure [[4]] 5 is a graphical representation of detectivity at 10.6 μm for the 1.5E12 cm^{-2} doping sample and for various temperatures.

Please replace the paragraph on page 7 lines 4-14 with the following amended paragraph:

Because of dark current present in high temperature QWIP devices, a primary design goal is to achieve high absorption. Starting from a standard QWIP structure, the absorption was improved by doping the wells more heavily and employing more wells. Three QWIP wafers were grown in a molecular beam epitaxy system. The main difference between the samples was doping density within each well. Referring to Fig. 1, a ~~The period of the~~ 100-repeat multiple quantum well structure 100 of [[a]] GaAs wells 102 and AlGaAs barriers 104 according to the invention is shown. The GaAs well center region was doped with Si to give an equivalent two-dimensional (2D) density of 1E12, 1.5E12, and 2E12 cm^{-2}, respectively. The well width were 6.6, 6.6, and 5.9 nm, the barrier width was 25.0, 25.0, and 24.0 nm, and the Al fraction was 0.200, 0.192, and 0.197, respectively, for the three samples. ~~The top~~ Top 106 and bottom 108 GaAs contact layers were 400 and 800 nm thick, doped with Si to 2E18 cm^{-3}.

Please replace the paragraph on page 7 lines 15-28 with the following amended paragraph:

For high speed and high frequency applications, an array is not usually required and the 45-degree edge-facet geometry is a practical one. At 45-degree incidence and for polarized light, the absorption per quantum well per pass is about 0.54% per well for a standard 10-μm QWIP with 5E11 cm^{-2} doping. For a doping density of 1.5E12 cm^{-2}, the one-well/one-pass absorption is expected to be $\eta_1 \sim 1.6\%$. If a 90% QWIP absorption is desired, the number of wells needed is determined by: $\exp(-2N\eta_1)=10\%$, which gives N=72. The factor of 2 in the exponential accounts for the double passes in a 45-degree facet detector geometry. For a single pass geometry, a different number of wells results. N=100 was chosen in order to ensure high absorption. Figure [[1]] 2 shows the measured double-pass polarized 45-degree incident transmission spectra for samples with 1E12 and 1.5E12 cm^{-2} doping densities, respectively. A high absorption was indeed achieved. The QWIPs were designed to cover the 10.3 and 10.6 μm branches of the CO_2 laser. Of course, QWIPs could also be designed to cover other ranges of wavelengths. Figure [[2]] 3 shows the spectral response curves for the three samples.

Please replace the paragraph on page 8 lines 1-12 with the following amended paragraph:

Further testing was performed to show that the design of the QWIPs was compatible with room and near room temperature operation. To maximize detector limited detectivity, the well doping density is such that the Fermi energy is $E_f=2k_BT$, where T is the desired operating temperature. The 2D doping density is related to the Fermi energy by $Nd=(m/\pi\hbar^2)E_f$, where m is the well effective mass. For T=80 K, the required density is about 4E11 cm^{-2} for GaAs wells. It is to be expected that the doping range of 1 – 2E12 cm^{-2} is where QWIPs operate near room temperature albeit with a reduced sensitivity. Measured results at various temperatures using a CO_2 laser tuned to 10.6 μm are shown in ~~Fig. 3~~ Figs. 4a-4c for the 1.5E12 cm^{-2} doping sample. It is clear that the device does work up to room temperature. Based on the measured dark current and responsivity and knowing the near ideal absorption (~100%), the detectivity D* at 10.6 μm and for polarized light is calculated and plotted in Fig. [[4]] 5 for various temperatures.

Please add the following new paragraph starting at page 8, line 26 of the specification:

Optionally, the dark current component of the detected signal is filtered to determine an intensity of the detected infrared radiation.